UNITED STATES PATENT AND TRADEMARK OFFICE

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10/586,680	07/20/2006	Kojiro Nakamura	062709-0174	6544

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 July 2006*.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *10 June 2008* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☒ All   b)☐ Some *   c)☐ None of:

    1.☒ Certified copies of the priority documents have been received.

    2.☐ Certified copies of the priority documents have been received in Application No. _____.

    3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date *7/20/2006*.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Specification

1.   This application does not contain an abstract of the disclosure as required by 37

CFR 1.72(b). An abstract on a separate sheet is required.

Claim Rejections - 35 USC § 102

2.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the

basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on
>
> sale in this country, more than one year prior to the date of application for patent in the United States.

3.   Claims 1-4 and 9-12 are rejected under 35 U.S.C. 102(b) as being anticipated by

Takenaka et al (US6356825B1).

Takenaka et al teaches:

Re Claim 1. A control method of controlling a refrigeration cycle of an air conditioning

system for a vehicle (ref 70), which is equipped with a variable displacement compressor (Figure

1, column 2 lines 66-67) driven by an engine (column 2 lines 9-11), the method comprising the

steps of:

determining a limit value of a discharge rate of the variable displacement compressor by

an engine speed or a variable related to the engine speed (abstract, column 6 lines 49-61); and

controlling an operation of the variable displacement compressor on the basis of the limit value (column 6 lines 49-61).

Re Claim 2. The control method of claim 1, wherein the limit value is determined by the engine speed and a load of ambient air (column 6 lines 12-19, 49-61. Takenaka et al teaches that the evap temperature is sensed which is the ambient temp. It also teaches that the accelerator position is sensed, which can be directly related to engine speed since the accelerator controls the throttling valve in an engine. The controller, ref 80, receives these inputs and controls the compressor by the control valve, ref 50.).

Re Claim 3. The control method of claim 1, wherein the variable is a vehicle speed (column 6 lines 49-61 teaches that the vehicle speed is an input for the controller).

Re Claim 4. The control method of claim 3, wherein the limit value is determined by the vehicle speed and a load of ambient air (column 6 lines 49-61 teaches that the vehicle speed is an input for the controller).

Re Claim 9. A control device of controlling a refrigeration cycle of an air conditioning system for a vehicle, which is equipped with a variable displacement compressor (Figure 1, column 2 lines 66-67) driven by an engine (column 2 lines 9-11), the control device comprising:

a limit-value determining unit for determining a limit value of a discharge rate of the

variable displacement compressor by an engine speed or a variable related to the engine speed

(abstract, column 6 lines 49-61); and

a discharge-rate controlling unit for controlling an operation of the variable displacement

compressor on the basis of the limit value (column 6 lines 49-61).

Re Claim 10. The control device of claim 9, wherein the limit-value determining unit

determines the limit value by the engine speed and a load of ambient air (column 6 lines 12-19,

49-61. Takenaka et al teaches that the evap temperature is sensed which is the ambient temp. It

also teaches that the accelerator position is sensed, which can be directly related to engine speed

since the accelerator controls the throttling valve in an engine. The controller, ref 80, receives

these inputs and controls the compressor by the control valve, ref 50.).

Re Claim 11. The control device of claim 9, wherein the limit-value determining unit

determines the limit value by a vehicle speed (column 6 lines 49-61 teaches that the vehicle

speed is an input for the controller).

Re Claim 12. The control device of claim 11, wherein the limit-value determining

unit determines the limit value by the vehicle speed and a load of ambient air (column 6 lines 49-

61 teaches that the vehicle speed is an input for the controller).

Claim Rejections - 35 USC § 103

4.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
> section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are
> such that the subject matter as a whole would have been obvious at the time the invention was made to a person
> having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the
> manner in which the invention was made.

5.   Claims 5-6 and 13-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Takenaka et al (US6356825B1) in view of Bascobert (US2001/0025500A1, as cited by

applicant).

The teachings of Takenaka et al have been discussed above.

Re Claim 5. Takenaka et al fails to teach wherein the limit value is a smaller one of a

limit value determined by the engine speed and another limit value determined by the vehicle

speed.

Bascobert teaches a computer (ref 46) that analyzes various input signals (ambient air, ref

42, engine speed, ref 43, and vehicle speed, ref 47) and compares them to control the compressor

discharge (Paragraph 32, It is inherent that the computer is capable of choosing the smaller value

since Bascobert teaches analyzing and comparing the input signals.).

In view of Bascobert's teachings, it would have been obvious to one of ordinary skill at

the time of invention to include with Takenaka et al's vehicle air conditioner a control program

because it improves the fuel economy and allows for a smoother acceleration.

Re Claim 6. Takenaka et al fails to teach wherein the limit value is a smaller one of a limit value determined by both of the engine speed mid a load of ambient air and another limit value determined by both of the vehicle speed and the load of ambient air.

Bascobert teaches a computer (ref 46) that analyzes various input signals (ambient air, ref 42, engine speed, ref 43, and vehicle speed, ref 47) and compares them to control the compressor discharge (Paragraph 32, It is inherent that the computer is capable of choosing the smaller value since Bascobert teaches analyzing and comparing the input signals.).

In view of Bascobert's teachings, it would have been obvious to one of ordinary skill at the time of invention to include with Takenaka et al's vehicle air conditioner a control program because it improves the fuel economy and allows for a smoother acceleration.

Re Claim 13. The control device of claim 11, wherein the limit-value determining unit determines the limit value by a smaller one of a limit value determined by the engine speed and another limit value determined by the vehicle speed.

Bascobert teaches a computer (ref 46) that analyzes various input signals (ambient air, ref 42, engine speed, ref 43, and vehicle speed, ref 47) and compares them to control the compressor discharge (Paragraph 32, It is inherent that the computer is capable of choosing the smaller value since Bascobert teaches analyzing and comparing the input signals.).

In view of Bascobert's teachings, it would have been obvious to one of ordinary skill at the time of invention to include with Takenaka et al's vehicle air conditioner a control program because it improves the fuel economy and allows for a smoother acceleration.

Re Claim 14. The control device of claim 11, wherein the limit-value determining unit determines the limit value by a smaller one of a limit value determined by both of the engine speed and a load of ambient air and another limit-value determined by both of the vehicle speed and the load of ambient air.

Bascobert teaches a computer (ref 46) that analyzes various input signals (ambient air, ref 42, engine speed, ref 43, and vehicle speed, ref 47) and compares them to control the compressor discharge (Paragraph 32, It is inherent that the computer is capable of choosing the smaller value since Bascobert teaches analyzing and comparing the input signals.).

In view of Bascobert's teachings, it would have been obvious to one of ordinary skill at the time of invention to include with Takenaka et al's vehicle air conditioner a control program because it improves the fuel economy and allows for a smoother acceleration.

6.   Claims 7 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takenaka et al (US6356825B1) in view of Sakamoto et al (US5022232).

The teachings of Takenaka et al have been discussed above.

Re Claim 7. Takenaka et al fails to teach further comprising the step of judging whether a cooling power of the air conditioning system is appropriate or not, wherein the operation of the variable displacement compressor is controlled in a manner that the discharge rate gets smaller when it is judged that the cooling power is excessive.

Sakamoto et al teaches that the CPU controls the compressor in such a manner that the discharge volume of refrigerant discharged from the compressor is decreased only when the cooling requirements are met (abstract, column 2 lines 18-22).

In view of Sakamoto et al's teachings, it would have been obvious to one of ordinary skill at the time of invention to include with Takenaka et al because having the compressor shut off only when the cooling requirements are met insures that the occupants in the vehicles remain comfortable and would therefor be preferable to include in a control algorithm for an air conditioner.

Re Claim 15. The control device of claim 9, wherein the limit-value determining unit judges whether a cooling power of the air conditioning system is appropriate and further changes a command value for the discharge-rate controlling unit so that the discharge rate of the variable displacement compressor gets smaller when it is judged that the cooling power is excessive.

Sakamoto et al teaches that the CPU controls the compressor in such a manner that the discharge volume of refrigerant discharged from the compressor is decreased only when the cooling requirements are met (abstract, column 2 lines 18-22).

In view of Sakamoto et al's teachings, it would have been obvious to one of ordinary skill at the time of invention to include with Takenaka et al because having the compressor shut off only when the cooling requirements are met insures that the occupants in the vehicles remain comfortable and would therefor be preferable to include in a control algorithm for an air conditioner.

7.   Claims 8 and 16 rejected under 35 U.S.C. 103(a) as being unpatentable over Takenaka et

al (US6356825B1) in view of Kuroda et al (US20020023451A1, as cited by applicant).

The teachings of Takenaka et al have been discussed above.

Re Claim 8 & 16. Takenaka et al fails to teach wherein the air conditioning system is a

CO_2 air conditioner.

Kuroda et al teaches a vehicle air conditioner with a variable displacement compressor

using CO_2 as the refrigerant.

In view of Kuroda et al's teachings, it would have been obvious to one of ordinary skill at

the time of invention to include with Takenaka et al because CO_2 is an art recognized equivalent

of a refrigerant and is well known in the art.

Conclusion

8.   The prior art made of record and not relied upon is considered pertinent to applicant's

disclosure. Farley et al (US6357242B1) teaches a control system and method for suppressing

head pressure spikes in a vehicle air conditioning system. Nosaka (US2003/0226368A1) teaches

a compressor device and control method for the same. Sugesawa et al (US2005/0066669A1)

teaches a vehicle air conditioner with discharge capacity control of compressor.

9.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to TRAVIS RUBY whose telephone number is (571)270-5760. The

examiner can normally be reached on Monday-Thursday 7:30-5:00, Friday 7:30-4:00 with every

other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Frantz Jules can be reached on 571-272-6681. The fax phone number for the

organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published applications

may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

applications is available through Private PAIR only. For more information about the PAIR

system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR

system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would

like assistance from a USPTO Customer Service Representative or access to the automated

information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Travis Ruby/

Examiner, Art Unit 3744

2/12/2009

/Frantz F. Jules/

Supervisory Patent Examiner, Art Unit 3744